CLAIMS

What is claimed is:

1. A light-emitting panel comprising:

a first substrate, wherein the first substrate comprises a plurality of sockets;

a plurality of micro-components, wherein each micro-component comprises a shell at least partially filled with a plasma-forming gas and wherein at least one micro-component of the plurality of micro-components is at least partially disposed in each socket;

a second substrate, wherein the second substrate is opposed to the first substrate such that the at least one micro-component is sandwiched between the first substrate and the second substrate; and

a plurality of electrodes, wherein at least two electrodes of the plurality of electrodes are adhered to only the first substrate, only the second substrate, or at least one electrode is adhered to each of the first substrate and the second substrate and wherein the at least two electrodes are arranged so that voltage supplied to the at least two electrodes causes one or more micro-components to emit radiation.

2. The light-emitting panel of claim 1, wherein the second substrate comprises at least one lens.

3. The light-emitting panel of claim 2, wherein the at least one lens is configurable to adjust a field of view of the light-emitting panel.

4. The light-emitting panel of claim 1, wherein the second substrate comprises at least one filter.

5. The light-emitting panel of claim 4, wherein the plurality of micro-components are configured to emit ultraviolet radiation, wherein each micro-component is coated with phosphor to convert the ultraviolet radiation to visible light, and wherein the at least one filter changes the visible light passing through the filter to visible light of a specific color.

6. A light-emitting panel, comprising:

a first substrate, wherein the first substrate comprises a plurality of sockets;

a plurality of micro-components, wherein each micro-component comprises a shell at least partially filled with a plasma-forming gas and wherein at least one micro-component of the plurality of micro-components is at least partially disposed in each socket;

a second substrate, wherein the second substrate is opposed to the first substrate such that the at least one micro-component is sandwiched between the first substrate and the second substrate; and

a plurality of electrodes, wherein at least two electrodes of the plurality of electrodes are arranged so that voltage supplied to the at least two electrodes causes one or more micro-components to emit radiation throughout the field of view of the light-emitting panel without crossing the at least two electrodes.

7. The light-emitting panel of claim 6, wherein the first substrate dissipates heat from the light-emitting panel.

8. A light-emitting panel comprising:

a first substrate, wherein the first substrate comprises a plurality of sockets and wherein each socket comprises at least one enhancement material;

a plurality of micro-components, wherein each micro-component comprises a shell at least partially filled with a plasma-forming gas and wherein at least one micro-component of the plurality of micro-components is at least partially disposed in each socket;

a second substrate, wherein the second substrate is opposed to the first substrate such that the at least one micro-component is sandwiched between the first substrate and the second substrate; and

a plurality of electrodes, wherein at least two electrodes of the plurality of electrodes are arranged so that voltage supplied to the at least two electrodes causes one or more micro-components to emit radiation.

9. The light-emitting display of claim 8, wherein the at least one enhancement material is disposed in or proximate to each socket and wherein the at least one enhancement material is selected from a group consisting of transistors, integrated-circuits, semiconductor devices, inductors, capacitors, resistors, control electronics, drive electronics, diodes, pulse-forming networks, pulse compressors, pulse transformers, and tuned-circuits.

10. The light-emitting display of claim 9, wherein the at least one enhancement material self-aligns in each socket.

11. The light-emitting display of claim 9, further comprising a controller, wherein the controller selectively controls the operation of the at least one enhancement material to adjust at least one characteristic of the micro-component.

12. A curing or sterilization device comprising a light-emitting panel, wherein the light-emitting panel comprises:

a first substrate, wherein the first substrate comprises a plurality of sockets;

a plurality of micro-components, wherein each micro-component comprises a shell at least partially filled with a plasma-forming gas, wherein the micro-component is configured to emit ultraviolet light, and wherein at least one micro-component of the plurality of micro-components is at least partially disposed in each socket;

a second substrate, wherein the second substrate is opposed to the first substrate such that the at least one micro-component is sandwiched between the first substrate and the second substrate; and

a plurality of electrodes, wherein at least two electrodes of the plurality of electrodes are arranged so that voltage supplied to the at least two electrodes causes one or more micro-components to emit the ultraviolet light.

13. The curing or sterilization device of claim 12, wherein the at least two electrodes of the plurality of electrodes are adhered to only the first substrate, only the second substrate, or at least one electrode is adhered to each of the first substrate and the second substrate.

14. The curing or sterilization device of claim 12, wherein the ultraviolet light is emitted throughout the field of view of the light-emitting panel without crossing the at least two electrodes.

15. A high resolution light-emitting panel, comprising:

a first substrate, wherein the first substrate comprises a plurality of sockets;

a plurality of micro-components, wherein each micro-component comprises a shell at least partially filled with a plasma-forming gas, wherein the micro-component is configured to emit radiation, and wherein at least one micro-component of the plurality of micro-components is at least partially disposed in each socket;

a second substrate, wherein the second substrate is opposed to the first substrate such that the at least one micro-component is sandwiched between the first substrate and the second substrate; and

a plurality of electrodes, wherein at least two electrodes of the plurality of electrodes are arranged so that voltage supplied to the at least two electrodes causes one or more micro-components to emit radiation.

16. A web fabrication process for manufacturing a plurality of light-emitting panels, the process comprising the steps of:

providing a first substrate;

disposing a plurality of micro-components on the first substrate;

disposing a second substrate over the first substrate such that the plurality of micro-components are sandwiched between the first substrate and the second substrate; and

dicing the first substrate and the second substrate to form individual light-emitting panels.

17. The process of claim 16, wherein the first substrate, the second substrate or the first substrate and the second substrate are provided as rolls of material.

18. The process of claim 16, wherein the first substrate comprises a plurality of sockets.

19. The process of claim 16, further comprising the step of disposing at least two electrodes on the first substrate, the second substrate, or at least one electrode on each of the first substrate and the second substrate.

20. The process of claim 19, wherein each light-emitting panel comprises the at least two electrodes, wherein the at least two electrodes are adhered to only the first substrate, only the second substrate, or at least one electrode is adhered to each of the first substrate and the second substrate, and wherein the at least two electrodes are arranged so that voltage supplied to the at least two electrodes causes one or more micro-components to emit radiation.

21. The process of claim 19, wherein each light-emitting panel comprises the at least two electrodes and wherein the two electrodes are arranged so that voltage supplied to the at least two electrodes causes one or more micro-components to emit radiation throughout the field of view of the individual light-emitting panel without crossing the at least two electrodes.

22. The process of claim 16, further comprising the steps of forming a plurality of sockets in the first substrate and wherein the step of disposing a plurality of micro-components on the first substrate further comprises at least partially disposing at least one micro-component of the plurality of micro-components in each socket of the plurality of sockets.

23. The process of claim 22, wherein the first substrate comprises a plurality of material layers and wherein the step of forming a plurality of sockets in the first substrate comprises the steps of selectively removing a plurality of portions of the material layers to form a plurality of cavities.

24. The process of claim 22, wherein the step of forming a plurality of sockets in the first substrate comprises the steps of patterning the first substrate with a plurality of cavities.

25. The process of claim 24, further comprising the steps of disposing at least one material layer on the first substrate so that the at least one material layer conforms to the shape of

each socket of the plurality of sockets and disposing at least one electrode between the first substrate and the at least one material layer.

26. The process of claim 24, further comprising the steps of disposing a plurality of material layers on the first substrate so that the plurality of material layers conform to the shape of each socket of the plurality of sockets and disposing at least one electrode within the plurality of material layers.

27. The process of claim 22, wherein the step of providing a first substrate comprises the step of forming a first substrate by disposing a plurality of material layers and wherein the step of forming a plurality of sockets in the first substrate further comprises the step of selectively removing a plurality of portions of the material layers to form a plurality of cavities.

28. The process of claim 27, further comprising the step of disposing at least one electrode on the first substrate, the second substrate, or the first substrate and the second substrate.

29. The process of claim 28, wherein the at least one electrode is sandwiched between two material layers of the plurality of material layers.

30. The process of claim 16, further comprising the step of disposing at least one enhancement material in, or proximate to, each socket.

31. The process of claim 30, wherein the at least on enhancement material is selected from a group consisting of transistors, integrated-circuits, semiconductor devices, inductors, capacitors, resistors, control electronics, drive electronics, diodes, pulse-forming networks, pulse compressors, pulse transformers, and tuned-circuits.

32. The process of claim 31, wherein the step of disposing the at least one enhancement material in or proximate to each socket comprises the steps of:

suspending the at least one enhancement material in liquid; and

flowing the liquid over the first substrate such that the at least one enhancement material settles in each socket.

33. The process of claim 31, wherein the sockets are of a corresponding shape to the at least one enhancement material and wherein the at least one enhancement material self-aligns in each socket.

34. The process of claim 16, further comprising the step of disposing a plurality of control electronics or drive electronics on the first substrate, the second substrate, or the first substrate and the second substrate.

35. The process of claim 16, wherein the web fabrication process is performed as a continuous high-speed inline process.